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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF CALIFORNIA-FRESNO DIVISION

PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS, *et al.*, Plaintiffs, v. GINA RAIMONDO, *et al.*, Defendants.	Case No. 1:20-cv-00431-JLT-EPG Case No. 1:20-cv-00426-JLT-EPG **DECLARATION OF LEE G. BERGFELD IN SUPPORT OF SACRAMENTO RIVER INTERVENORS' OBJECTION TO INTERIM OPERATIONS PLAN EXTENSION** Date: TBD Time: TBD Dept.: 5 Judge: Honorable Jennifer L. Thurston
THE CALIFORNIA NATURAL RESOURCES AGENCY, *et al.,* Plaintiffs, v. GINA RAIMONDO, *et al.*, Defendants.	

DECLARATION OF LEE G. BERGFELD

I, Lee Bergfeld, declare that the following facts are true and correct and/or are based on my expert opinions:

1. I am a registered civil engineer in California and Nevada. I specialize in the areas of hydrology, water supply, reservoir operations modeling, operations of the Central Valley Project and State Water Project, and related areas. I am a Principal at MBK Engineers ("MBK"), located at 455 University Avenue, Suite 100, Sacramento, CA 95825. MBK Engineers specializes in water resources engineering, and performs these engineering services for cities, counties, state and federal agencies, individual landowners, and other entities. MBK Engineers was formed in 1967 (then known as Murray, Burns, and Kienlen), and currently employs 27 professional engineers. From its inception until the present day, MBK Engineers has provided water rights and engineering services to many of the individual districts, water companies, and entities of the Sacramento River Settlement ("SRS") Contractors. I joined MBK Engineers in 2005. I became a Principal in 2014.

2. I have been retained as an expert to provide expert opinions and testimony on behalf of Defendants-Intervenors, the Sacramento River Settlement Contractors ("SRS Contractors") and the Tehama-Colusa Canal Authority ("TCCA"), collectively the "Sacramento River Intervenors."

3. Throughout my career I have monitored, observed, and analyzed the operations of Shasta Lake, Keswick Reservoir, Sacramento River flows, SRS Contractor diversions, and Central Valley Project ("CVP") and State Water Project ("SWP") operations. I performed this work on behalf of SRS Contractors and others who divert water from the Sacramento River, including water service contractors in the TCCA service area. My work in this regard related to reservoir operations, water diversions, water management, water rights, and water transfers. I have also performed modeling of the CVP and SWP using a variety of models and tools in support of numerous analyses and projects that affect various divisions and facilities of both the CVP and SWP.

4. I have extensive knowledge of the hydrology of California's Central Valley. I have analyzed stream flow data for numerous rivers and streams including the Sacramento River and most of its major tributaries. I have calculated water demands for agricultural irrigation, estimated consumptive use, groundwater pumping, and return flows for the Sacramento River watershed as part of several projects. In addition, frequent discussions with United States Bureau of Reclamation ("Reclamation") and California Department of Water Resources ("DWR") personnel, together with field observations, contribute to my understanding of CVP and SWP operations.

5. During water years 2020, 2021, and 2022 I was personally involved in numerous virtual meetings, conference calls, and discussions with SRS Contractors, Reclamation, DWR, National Marine Fisheries Service ("NMFS"), State Water Resources Control Board, California Department of Fish and Wildlife, and others related to the hydrology, operation of the CVP and SWP, and development of the temperature management plans. In 2021, I participated regularly on behalf of the SRS Contractors in the Meet and Confer virtual meetings held under the 2019 NMFS Biological Opinion (*see PCFFA* ECF No. 120-4, at 779–80) and virtual meetings of the Sacramento River Temperature Task Group ("SRTTG"). In 2022, I participated in meetings to discuss and prepare technical information for consideration by the Shasta Planning Group described in the 2022 Interim Operations Plan ("IOP").

6. My qualifications to render the opinions contained in this declaration are set forth in my professional resume, attached hereto as Exhibit A and incorporated herein by this reference.

7. This declaration describes the results of an analysis I performed of alternative operations of Shasta Lake for 2022. Additionally, I have read the declaration of Mr. Les Grober submitted in support of the extension of the 2022 IOP ("IOP Extension") and I provide information in response to some of Mr. Grober's opinions.

Analysis of Operations to Meet Alternative Temperature Targets

8. I performed an analysis, in cooperation with Dr. Mike Deas, to evaluate the operation of Shasta Lake to meet alternative temperature targets in 2022 as opposed to those determined by the Shasta Planning Group under the 2022 IOP. This analysis simulates a Keswick release schedule using DWR's, April 90 percent exceedance forecast of inflow into Shasta Lake.

The analysis started on March 22, 2022, with the initial, observed storage of 1.719 million acre-feet ("MAF"). The Shasta Planning Group evaluated and selected the Keswick release schedule in the late March to early April period, based on the April forecasted inflow. I used a Keswick release schedule of 3,500 cubic feet per second ("cfs") for the month of April. For the months of May through September I used the same average monthly releases as included in the final temperature management plan ("TMP") submitted by Reclamation to NMFS on May 2, 2022. The average monthly releases in the final TMP were 4,500 cfs for the months of May through August and 4,000 cfs for September.

9. Dr. Deas used this information to make several simulations with a temperature model of Shasta Lake. The first simulation was an operation of the temperature control device ("TCD") at Shasta Dam that attempts to meet the temperature targets described in the final TMP. The second simulation was an operation of the TCD that attempts to meet a temperature target of 56 degrees Fahrenheit ("°F") upstream of Highway 44. A temperature target of 56 °F upstream of Highway 44 is similar to the temperature management operation that occurred in 2015. The third simulation was an operation of the TCD that attempts to meet a temperature target of 56 °F at Clear Creek. A temperature target of 56 °F at Clear Creek is similar to the temperature management operation that occurred in 2014.

10. Results from each of these three simulations show a loss of temperature control at Shasta Dam occurs prior to the end of the temperature management season on October 31st. For the purposes of this declaration, the loss of temperature control is when the TCD operations transition to the side gates alone (all other TCD gates are closed and both side gates are open), at which point typical TCD operations no longer provide a measure of operational control of Shasta Dam release temperatures. Results from the simulation with the temperature targets in the final TMP are generally consistent with results in the final TMP. The results from the simulation with a temperature target of 56 °F upstream of Highway 44 show the loss of temperature control occurred approximately seven weeks later than the simulation with final TMP temperature targets. This is also approximately seven weeks later than the actual date of August 22, 2022, when TCD operations transitioned to the use of the side gates alone. The results from the simulation with a

temperature target of 56 $^{\circ}$F at Clear Creek show the loss of temperature control occurred approximately four weeks later than the simulation with final TMP temperature targets.

Response to the Declaration of Mr. Les Grober

11. Mr. Les Grober, offering a declaration on behalf of the State Plaintiffs, opines that "Improved storage in September 2022 [relative to September 2021] is attributable to both the constraints on release of stored water and the carryover storage provisions of the IOP." Grober Decl., at ¶ 19, *PCFFA* ECF No. 406-6, *CNRA* ECF No. 286-6. While it is true that storage in September 2022 was approximately 0.4 MAF higher than in 2021, the requirements in the 2022 IOP are not responsible for this increase.

12. I performed modeling and technical analysis of various release scenarios from Shasta Lake for a range of different forecasted inflows in 2022. This work was performed from mid-February through mid-April. The results were shared with Reclamation and other agencies that are members of the Shasta Planning Group described in the 2022 IOP. It is my understanding that the Shasta Planning Group decided on the Keswick release schedule during this period, based on April forecasts of inflow. The final TMP included a forecasted storage in Shasta Lake on September 30, 2022 of 1.135 MAF. The plan developed under the 2022 IOP for Shasta Lake storage on September 30, 2022 was approximately 0.035 MAF higher than the storage one year earlier. Therefore, I disagree with Mr. Grober's statement that the 2022 IOP was responsible for the 0.4 MAF increase in Shasta Lake storage from September 30, 2021 to September 30, 2022.

13. Mr. Grober makes several comparisons of unimpaired flow for the Sacramento River and its major tributaries, inflow to Shasta Lake, end-of-September Shasta Lake storage, and the year-over-year change in end-of-September Shasta Lake storage as support for his conclusion that the 2022 IOP resulted in the 0.4 MAF increase in Shasta Lake storage. Grober Decl., at ¶¶ 21-24. However, most of the increase in storage was because hydrology improved over the April forecasted used. The 2022 IOP resulted in a plan to draw Shasta Lake storage down to nearly the same level as at the end of water year 2021. The primary causes of the 0.4 MAF increase in Shasta Lake storage were a difference between the forecasted and actual inflow into Shasta Lake for the period of April through September 2022 and lower actual Keswick releases to the Sacramento

River than the Keswick release schedule developed under the 2022 IOP.

14. Figure 1 illustrates the forecasted and the observed (actual) inflow into Shasta Lake for the period of April through September 2022. The forecasted values are from the April 1st DWR forecast for the 90 percent exceedance as published in Bulletin 120. Reclamation uses the 90 percent exceedance (a conservative estimate) in the development of the TMPs and other forecasts of CVP operations.

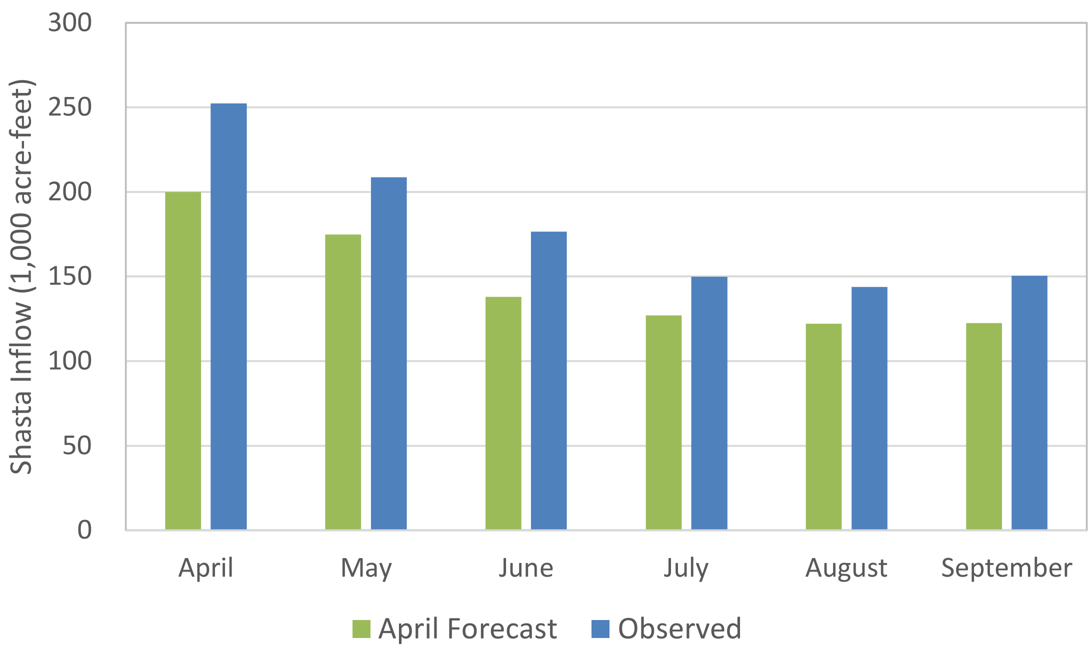

Figure 1. Forecasted and Observed (Actual) Inflow to Shasta Lake from April through September 2022

15. Data in Figure 1 show the actual inflow to Shasta Lake for each of the six months exceeded the forecasted inflow used in the development of the final TMP. Actual inflow exceeded the forecast in part due to precipitation in April. Precipitation records at Shasta Dam show a total of 4.27 inches for April.[1] The total difference in the volume of inflow over this period was approximately 0.2 MAF. Therefore, approximately half of the difference between the forecasted storage of 1.135 MAF and the actual storage of 1.515 MAF is a result of more inflow than the forecast. This is not a result of the 2022 IOP.

[1] Precipitation data were obtained from the U.S. Bureau of Reclamation, Shasta Lake Daily Operations (Apr. 2022) https://www.usbr.gov/mp/cvo/vungvari/shadop0422.pdf (last visited Oct. 28, 2022).

16. Figure 2 illustrates the monthly volume of water released from Keswick for the final TMP and the actual release for the same April through September period of 2022.

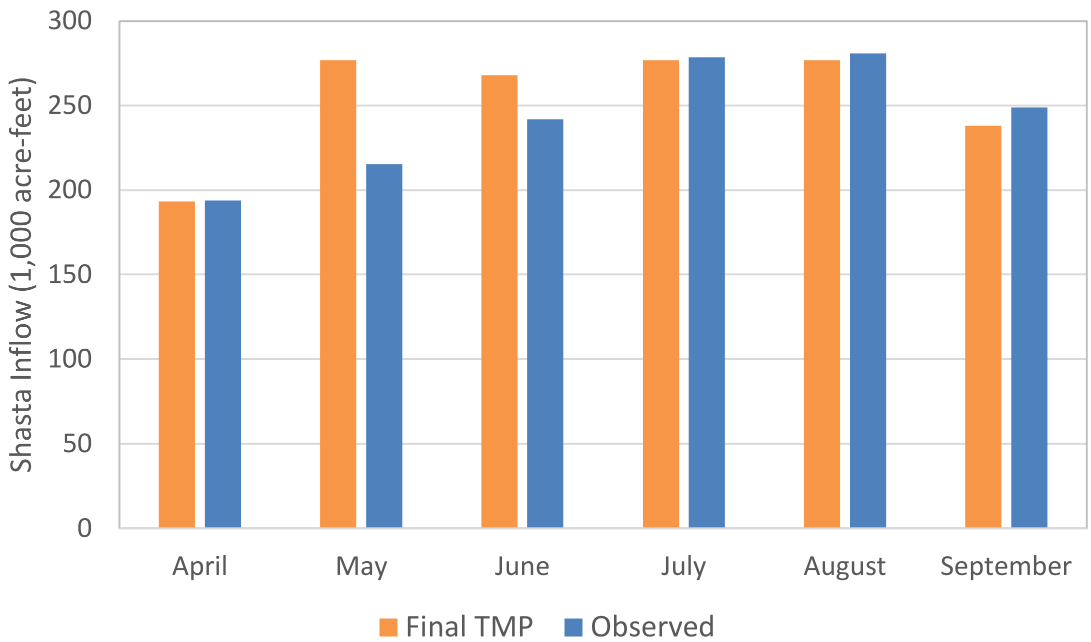

Figure 2. Planned and Observed (Actual) Keswick Releases from April through September 2022

17. Data in Figure 2 show the actual volume of Keswick release was less than the Keswick release schedule in the final TMP, particularly in May and June. The total difference in the volume of Keswick release over this period was approximately 0.07 MAF. The same precipitation events in April that contributed to actual inflow exceeding forecasted inflow into Shasta Lake resulted in run off into streams tributary to the Sacramento River downstream of Shasta Dam. This tributary flow was available to meet demands for water downstream of Shasta Dam with less release than planned in the final TMP. This is also not a result of the 2022 IOP.

18. Mr. Grober does acknowledge in other statements in his declaration that hydrology did help contribute to the year-over-year increase in September storage. Grober Decl., at ¶ 20. However, he then minimizes the effect of hydrology with comparisons of the unimpaired flow for the Sacramento River watershed between 2020 and 2022 and comparisons of year-over-year changes in Shasta Lake storage between September 2019 to 2020 and September 2021 to 2022. *Id*. at ¶ 21. When describing the year-over-year changes in Shasta Lake storage, Mr. Grober states, "In a year with virtually the same hydrology, storage is on track to be increased by 0.4 maf

[MAF], instead of being depleted by 1.2 maf [MAF]." Grober Decl., at ¶ 22. This statement ignores the difference in the water available for release from Shasta Lake in 2020 as compared to 2022. Shasta Lake storage on April 30, 2020 was 3.687 MAF, more than double the 1.808 MAF in storage on April 30, 2022.[2] The 1.879 MAF difference in storage available for release between the two years is largely due to the hydrology in the preceding year or years. Water year 2020 followed a wet year in 2019 while water year 2022 followed a dry year (2020) and a critical year (2021). I do not find the comparison of change in storage between September 2019 to 2020 and September 2021 to 2022 relevant to support Mr. Grober's conclusion that the 2022 IOP resulted in increased storage in September 2022, compared to September 2021.

19. Finally, Mr. Grober describes the volume of water that remained in Shasta Lake at the end of water year 2022 as, "All the water that is retained in storage is available for use later. It is not wasted or forgone." Grober Decl., at ¶ 39. While it is true that the water is still available for future use, it may still represent a forgone opportunity to have made use of the water this year. The potential exists for enough precipitation in water year 2023 that Shasta Lake will reach the maximum allowed storage and spill water, either to maintain required flood control space or because the reservoir is full. If this occurs, water that was not released in 2022 is a forgone opportunity to put water to beneficial use during a critical drought. I analyzed the probability of Shasta Lake reaching a storage level that would require a flood control release when starting from the actual end-of-September 2022 storage of 1.515 MAF. The analysis used the historical record of inflows, assumed a minimum Keswick release, and the current forecast for imports from the Trinity River system. Based on this analysis, there is approximately a 35 percent chance the inflow in water year 2023 will be enough to result in flood control releases when starting from an end-of-September storage of 1.515 MAF. This means there is approximately a 35 percent chance that a portion of the water retained in storage at the end of 2022 will be effectively spilled this coming winter.

[2] Mr. Grober acknowledges that 2019 was a wet year and therefore water was available to "augment supplies in 2020," (Grober Decl., ¶ 22 n. 4), but still credits the 2022 IOP for the 0.4 MAF increase in year-over-year storage in Shasta Lake. *Id*. at ¶ 24.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 31st day of October 2022, in Sacramento, California.

By: ______________________
LEE G. BERGFELD

EXHIBIT A

EDUCATION

- University of California, Davis
  MS in Civil Engineering, 2005
- United States Air Force Academy, Colorado Springs, CO
  BS in Civil Engineering, 1995

PROFESSIONAL LICENSES AND SOCIETIES

- Registered Civil Engineer in California, No. C69623
- Registered Civil Engineer in Nevada, No. 19536
- Member, American Society of Civil Engineers

EXPERIENCE

2005 to Present **MBK Engineers,** Sacramento, CA

Principal

Civil engineer in fields of reservoir modeling, water supply planning, hydrology, project feasibility, and related problems. Develops and utilizes models for the evaluation of water supply, water rights, transfers, hydropower, and environmental requirements for irrigation and water districts in California, Nevada, and Oregon with a focus on reservoir operations planning including operations of the Central Valley Project and State Water Project in California.

PROJECTS

System Re-operation Study – Developed strategies and analyzed effects of strategies to improve operations of various CVP, SWP, and local reservoirs on the Sacramento, Feather, and Merced rivers to meet water supply, flood control, and environmental objectives. Provide technical assistance and guidance in development of Statewide Water Available for Replenishment Report as part of Sustainable Groundwater Management Act.

ACWA Integrated Storage Operation – Developed and analyzed operations of multiple projects as integrated components of CVP and SWP operations. Operational objectives included improve water supply reliability and ecosystem improvements.

Franks Tract Project – Developed model to analyze how CVP/SWP operations would respond to changes in Delta salinity conditions with a gate on Threemile Slough. Water operations model simulated changes in upstream reservoir operations, Delta exports, and south-of-Delta deliveries. Reviewed project operations and benefits when operated under the Biological Opinions for Delta smelt (2008) and Chinook salmon (2009).

San Luis Low Point Improvement Project – Assisted in development of alternatives and performed water operations modeling to support Plan Formulation Report, Feasibility Study, and Environmental Documentation. Modeled project alternatives in CalSim II and conducted sensitivity analysis to key baseline assumptions including climate change. Evaluated alternatives that included expanded San Luis Reservoir storage capacity and new storage reservoirs.

Semitropic Stored Water Recovery Unit – Developed modeling tools to define operations and quantify benefits of Reclamation's participation in Semitropic Stored Water Recover Unit. Quantified CVP-wide yield to support economic analysis and evaluated ability to provide additional refuge water supply.

Merced Irrigation District Operations Models – Developed daily and monthly time-step models to simulate and forecast water and hydropower operations on the Merced River. Analyzed water supply risks associated with water transfers and various operational strategies and requirements. Developed water operations and water temperature model for FERC re-licensing.

Upper San Joaquin River Basin Storage Investigation - Assisted in development and use of water operations models for the upper San Joaquin River. Developed analytical tools and performs hydrologic analysis for reservoir operations and conjunctive management of Friant water supply. Evaluates effects of new storage using CalSim II.

Friant-Metropolitan Partnership – Partnership investigates exchanges between the Friant Division of CVP and Metropolitan's SWP supplies.